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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,993	02/12/2001	Stephen J. Elliott	10002385-1	1954

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

SHAHRIER, SHARIF M

ART UNIT	PAPER NUMBER
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2664

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,993

Applicant(s)

ELLIOTT, STEPHEN J.

Examiner

Sharif M Shahrier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Abstract

1. The abstract of the disclosure is objected to because of the presence of the title. Correction is required. See MPEP § 608.01(b). The title must be removed from the abstract page.

Claim Objections

2. Claim 20 is objected to because of the following informalities: It depends on itself, needs to be re-written.

Note: Claim 20 is rejected based on the assumption that it depends on claim 19.

Claim Rejections – 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho (US 6, 038,235) and in view of El-Batal (US 6,625,144).

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Regarding claim 1, Ho teaches a system for communication over a fiber channel (FC) loop connected to a user device.

Figure 3 teaches a receive buffer (352) for storing received information from the fiber channel loop, and the specification refers to this as (col. 8, line 44) "... receive buffer 352 is used to buffer data received from loop [fiber channel loop] input".

Ho teaches (col. 1, line 38) that computer device attached the FC loop is used for processing data and instructions (i.e. packets) received from the loop. Ho further teaches, (col. 2, line 25) the *arbitration loop physical address (ALPA)*, associated with received packet, to identify information intended for the user device.

Ho does not explicitly teach a low bandwidth interface.

El-Batal teaches (Abstract) an RS-232 interface [low bandwidth interface] between *Redundant Arrays of Independent Disks (RAID)* controllers and a user device (PC).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Ho to incorporate a low bandwidth interface of the type taught by El-Batal. The motivation to combine is because low bandwidth interfaces are often used for connecting slower hardware devices to local area networks, such as Ethernet or Fiber Channel.

Regarding claim 17, Ho teaches in Figure 3 the control circuit and interfaces of a node in a Fiber Channel arbitrated loop. A pair of receive and transmit buffers are clearly indicated as 352 & 354 respectively. All interface circuitry, in and out of the fiber loop, are illustrated in Figure 3. For instance, the first interface to a first FC can be elements

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220, 302, 312, 314, and second interface to a second FC can be elements 326, 344, 349 and 232. Ho also teaches that a controller on the host adapter card may arbitrate for access (col.2, line 13). Ho further teaches that the receive buffer 352 can buffer data before communication via the low bandwidth interface.

Ho does not explicitly teach a low bandwidth interface.

El-Batal teaches (Abstract) an RS-232 interface [low bandwidth interface] between *Redundant Arrays of Independent Disks (RAID)* controllers and a user device (PC) .

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Ho to incorporate a low bandwidth interface of the type taught by El-Batal. The motivation to combine is because low bandwidth interfaces often connect multiple user devices to a high-speed local area network (LAN) such as ATM/SONET ring and fiber channel loop. This is done via User-to-Network Interfaces (UNI), operating much more slowly than the aggregate speed of the LAN. Each user device uses the LAN infrequently, thus the transmission bandwidth subsumed by each device is small compared with the overall bandwidth of the LAN media. Thus, to make more efficient use of the fiber channel bandwidth and achieve better utilization of the fiber, multiple devices are connected to the loop via low speed UNI.

4. Claims 2, 3, 4-6, 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho and El-Batal as applied to claim 1 above, and further in view of Miller (US 6,061,360).

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Regarding claim 2, the combined method of Ho and El-Batal discloses all aspects of the claimed invention set forth in the rejection of Claim 1, and Ho further teaches a transmit buffer 354 for storing information sent from the user device.

Ho does not teach the transmission of second stored information via the FC system after an amount of second stored information exceeds a predetermined value.

Miller teaches a frame buffer system where arbitration and data transmission takes place after some conditions are satisfied, including the data frame buffer threshold being met (col. 16, line 25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to modify the transmit buffer of Ho so that communication of stored information only takes place after the stored information exceeds a predetermined value.

The motivation to combine is that Ho's buffer can use a credit-pool scheme to monitor the threshold, i.e. an incoming packet uses up a credit in the credit-pool; once sufficient number of credits is used up, it means a threshold is reached in the buffer. The buffer is off-loaded through the FC loop, and the credit-pool is again replenished. This method achieves better transfer rate matching between low bandwidth interfaces and the higher speed Fiber Channel.

Regarding claim 3, the combined method of Ho and El-Batal discloses all aspects of the claimed invention set forth in the rejection of claim 2, and Miller further teaches a flow control mechanism based on Buffer-to-Buffer credit control scheme. The credits set a predetermined limit on the number of frames that can be transferred (col. 16, line 52).

This scheme is effectively a flow control mechanism to prevent the buffer at the destination from being overflowed, i.e. existing buffered frames from being lost or overwritten.

Regarding claim 4, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of Claim 3, and El-Batal further teaches a low bandwidth interface in the form of RS-232 as set forth in the rejection of claim 1.

Regarding claim 5, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 2, and El-Batal further teaches a disk array system connected to a PC user device. The specification further discloses that the DB9 interface linking the disk array to the user device provides configuration and status information to the user (col. 7, line 55). Tables 1, 2 and 3 further describes the various control and status information for the disk array controller, that the user device can utilize for monitoring and diagnostic purposes with respect to the disk array.

Regarding claim 6, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 4, and El-Batal further teaches the DB9 connector, packaging the RS-232 interface and modem signals (col. 8, line 38).

Regarding claim 9, Ho teaches a system for communication over a fiber channel (FC) loop connected to a user device. Figure 3 teaches the interface to the FC system, for

connecting multiple devices to the fiber channel loop. Figure 3 also teaches a receive buffer (352) for storing received information from the fiber channel loop, and the specification refers to this as (col. 8, line 44) "... receive buffer 352 is used to buffer data received from loop [fiber channel loop] input". Ho further teaches that each device on the fiber channel must arbitrate for access, using the optical controller of the host adapter card (col. 2, line 12). The arbitration is performed on behalf of each host computer system. The optical controller is implemented as an Application Specific Integrated Circuit (ASIC) (Figure 2), or it may be implemented using a general-purpose microprocessor.

Ho does not explicitly teach a low bandwidth interface.

Neither, does Ho teach arbitrated access to the FC when the amount of second stored information exceeds a predetermined value.

El-Batal teaches (Abstract) an RS-232 interface [low bandwidth interface] connection between *Redundant Arrays of Independent Disks (RAID)* controllers and a user device (PC). Also, Miller teaches a frame buffer system where arbitration and data transmission takes place after some conditions are satisfied, including the data frame buffer threshold being met (col. 16, line 25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the systems of Ho and El-Batal, to incorporate the teachings of El-Batal and Miller. The motivation to combine is: (1) to achieve better data transfer rate matching between low speed interfaces and high-speed networks, and (2)

low bandwidth interfaces are often used to connect plurality of slower devices to high-speed networks.

Regarding claim 10, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 9, and El-Batal further teaches a low bandwidth interface in the form of RS-232 as set forth in the rejection of claim 9.

Regarding claim 11, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 10, and El-Batal further teaches (front page figure) a personal computer and array controllers.

Regarding claim 12, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 11, and El-Batal further teaches that the Charon controller configures the array controller to be a Ethernet Port-to-SCA-SCSI controller (col. 4, line 10). This is analogous to a network controller.

Regarding Claim 13, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 12, and El-Batal further teaches that the operation of a disk array controller is governed by firmware within the controller; the firmware can configure the controller to be a Ethernet Port-to-SCA-SCSI

controller (col. 3, line 60) & (col. 4, line 9). This is analogous to the array controller implementing network drive access protocols.

Regarding claim 14, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 9, and El-Batal further teaches (col. 3, line 59) disk array controllers (microprocessor) operating under firmware instructions that re-configures (emulates) disk arrays in the event of failure.

Regarding claim 15, the combined methods of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 9, and Miller further teaches a flow control mechanism based on Buffer-to-Buffer Credits. The available Credits set a predetermined limit on the number of frames that can be transferred (col. 16, line 52). It is thus inherent that a microprocessor can implement the flow control mechanism, to prevent buffer associated with FC system from being overwritten.

Regarding claim 16, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 10, and El-Batal further teaches a user device (PC) connected to a disk array using RS-232 with full modem signaling (col. 3, line 59). El-Batal also teaches a dual-active design for the disk array system (col. 4, line 59), which inherently means that data is copy onto two disks in case of failure to one of the drives. This is analogous to "mirroring" of data.

5. Claim 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho, El-Batal and Miller as applied to claims 1-6 above, and further in view of Bhagwat (US 6,721,805).

Regarding claim 7, the combined method of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 6.

However, these references do not teach a modem for remote data access.

Bhagwat teaches the use of a modem to connect to a remote application server (col.1, line 38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Ho, El-Batal and Miller to incorporate a modem for remote data access, as taught by Bhagwat. The motivation to combine is because a remote network and low-bandwidth link connecting user device often use different protocols, different modulation and have different speeds. Thus connecting a modem between them will convert between the protocols; perform modulation/demodulation and shaping and rate control of traffic in both directions to achieve a better matching of transmission rates.

Regarding claim 8, the combined methods of Ho, El-Batal and Miller discloses all aspects of the claimed invention set forth in the rejection of claim 7.

However, these references do not teach an Internet Service Provider (ISP).

Bhagwat teaches (col. 3, line 39) that TCP/IP protocol allows communication with the remote application server. The TCP/IP protocol is generally used by ISPs for remote data services.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Ho, El-Batal and Miller to incorporate remote data services by an ISP, as taught by Bhagwat. The motivation to combine is because ISPs can connect multiple user device systems to the Internet backbone via gateways to facilitate remote data services to servers or other devices.

6. Claim 18, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho and El-Batal as applied to claim 17 above, and further in view of Vajk (US 5,265,033).

Regarding claim 18, the combined methods of Ho and El-Batal discloses all aspects of the claimed invention set forth in the rejection of claim 17.

However, these references do not disclose a microprocessor to provide authorization.

Vajk describes a local microprocessor to perform security/authorization (col. 5, line 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Ho and El-Batal to incorporate a microprocessor to provide authorization, as taught by Vajk. The motivation to combine is because a microprocessor can flexibly implement authorization/authentication protocols in firmware.

Regarding claim 19, the combined methods of Ho and El-Batal discloses all aspects of the claimed invention set forth in the rejection of claim 17.

However, these references do not disclose a microprocessor, which restricts access to restricted devices on the fiber loop.

Vajk teaches authorized access only to terminals resident on an ATM network, which may be configured as a loop or a ring (col. 3, line 52), (col. 5, line 15).

Regarding claim 20, the combined methods of Ho and El-Batal discloses all aspects of the claimed invention set forth in the rejection of claim 19.

However, these references do not disclose a scenario where the restricted device is a storage unit. Vajk teaches information storage device on an ATM network (col. 5, line 32).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharif M Shahrier whose telephone number is (703) 305-8707. The examiner can normally be reached on MF: 9:00am - 5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Ricky Ngo can be reached on (703) 305-4798. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

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SMS


RICKY NGO
PRIMARY EXAMINER